Abstract

Developing and Testing an Audit of Nurse Sensitive Quality Indicators for Older Adults with Fragility Hip Fracture

BACKGROUND: Fragility hip fracture in older adults often has poor outcomes but these outcomes can be improved with attention to specific quality care indicators.

PURPOSE: The International Collaboration of Orthopaedic Nursing (ICON) developed an audit process to identify the extent to which internationally accepted nursing quality care indicators for older adults with fragility hip fracture are reflected in policies, protocols, and processes guiding acute care.

METHODS: A data abstraction tool was created for each of 12 quality indicators. Data were collected using a mixed methods approach with unstructured rounds. A rationale document providing evidence for the quality indicators and a user evaluation form were included with the audit tool. A purposeful sample of 35 acute care hospitals representing seven countries was selected.

RESULTS: Thirty-five hospitals (100%) completed the survey. Respondents viewed the content as relevant and applicable for the defined patient population. While timing and frequency of implementation varied among and within countries, the identified quality indicators were reflected in the majority of policies, protocols, or processes guiding care in the hospitals surveyed.

CONCLUSION: Developing and testing an audit of nurse sensitive quality indicators for older adults with fragility hip fracture demonstrates international consensus on common core best practices to ensure optimal acute care.

Key words: Fragility Hip Fracture, Nursing Quality Care Indicators, Audit process

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BACKGROUND

The number of adults over age 65 globally is projected to nearly double within the next thirty years with profound implications for health care sustainability (Wan, 2015). A fragility hip fracture is a devastating injury commonly afflicting older people and their families. People with fragility hip fractures require extensive care at significant health care costs (Nikitovic, Wodchis, Krahn, & Cadarette, 2013). The outcomes after hip fracture are poor and include impaired mobility, increased reliance on others, diminished health and often death (Magaziner, et. al., 2003; Maher, et. al., 2012; Panula, et. al., 2011). These poor outcomes depend in part on individual characteristics, the specific injury, and health care delivery (Lund, Moller, Wettersley & Lundstrom, 2014; Sheehan, Sobolev, Chudyk, Stephens & Guy, 2016).

The association between care delivery and outcomes prompted several nations worldwide to invest in registries, research, and quality improvement initiatives for this vulnerable population (American College of Surgeons, 2017; Dy, Bumpass, Makhni & Bozic, 2016; Royal College of Physicians, 2015; National Institute for Health and Care Excellence 2014; National Office of Clinical Audit, 2015; Thorngren, 2008). These initiatives defined surgical and medical quality indicators to improve outcomes after fragility hip fracture. The audit of these indicators in practice led to demonstrable improvements in care processes and patient outcomes (Neuberger, et. al., 2015). It is imperative that these standards are consistently applied in practice settings to enhance recovery for patients and for health care sustainability.

In 2010, the International Collaboration of Orthopaedic Nursing (ICON) identified improving care of patients with fragility hip fracture as a priority for action. ICON is an organization that unites national orthopaedic nurses' associations in promoting best practice for orthopaedic patients on a global scale (Meehan, Maher, & Hommel, 2015). Building on the success of the national initiatives noted above, ICON formed a Hip Fracture Work Group to synthesize the evidence on best practice nursing care for older adults with fragility hip fracture. The team consisted of national orthopaedic nursing leaders and researchers from 9 countries across 3 continents.

The work group reviewed the literature and via SKYPE identified evidence supported best practice recommendations for this population. Through this process, the team achieved consensus on a set of international care standards that were relevant and applicable across participants' nations and care settings. This work culminated in the publication of a two-part, peer-reviewed article (Maher, et. al., 2013; Maher, et al, 2012). This information was also presented at a number of nursing and multidisciplinary conferences internationally.

Recognizing that knowledge alone does not improve practice, the Hip Fracture Work Group, using the identified evidence supported care standards as a foundation developed and validated the Best Practice Care Standards Audit Tool. This audit tool was designed to assist point of care leaders in identifying the requisite clinical practices that support optimal patient outcomes. It was postulated that clinical leaders who completed the audit would identify care gaps and this process could serve as a catalyst for improvement activity. Therefore, the purpose of this article is to:

1. Outline the process for developing and validating the audit tool; and

2. Identify the extent to which evidence based care practices are reflected in nursing policy and procedures at select acute care settings around the world.

METHODS

Using a qualitative and unstructured round approach, the team met repeatedly on SKYPE to draft the audit and supporting evidence. The audit contains 12 quality indicators that, with the exception of timing of surgery, are considered nurse sensitive. These include ensuring early mobility, malnutrition prevention, catheter associated UTI prevention, pain management, delirium assessment and prevention, pneumonia prevention, constipation prevention and management, VTE prevention, pressure injury prevention, care transitions and bone health. Each indicator is interrogated with four to five yes/no questions and color coded for ease of identification.

The audit was Beta tested using a mixed methods approach. The initial round included a purposeful sample of five hospitals selected from each of five countries for a total of 25 hospitals. Each participating hospital performed a minimum of 100 hip fracture surgeries a year. Each national representative recruited sites from their own country. Orthopaedic clinical leaders at these sites were electronically provided a package consisting of: 1) Brief instructions for completing the audit, 2) A copy of the audit tool, 3) A rationale document with evidence supporting each component of the audit (ICON Hip Fracture Work Group, 2016), and 4) A user experience survey to determine any concerns with the length, clarity, applicability and relevance of the survey and whether they intended to make changes as a result of participating in the audit process.

Respondents identified items that were subject to misinterpretation (e.g. aggregate

data on patient volumes, gender) and clarified that to effectively complete the audit the orthopaedic clinical leader must be directly involved at the point of care. Participants also indicated that it would be useful to note whether participating sites provided nursing staff with information about specific quality indicators during orientation, ongoing competency training, or other professional development initiatives. Based on these results and discussions, the team generated a set of audit criteria:

- The audit will be comprehensive, encompassing relevant care
- Each care standard is evidence based.
- Each care standard is deemed relevant and applicable across nations.
- Nursing care influences the achievement of the standard.
- The audit language is clear and understandable across clinical sites and nations.
- Requested data is readily retrievable by clinical leaders.
- The audit is succinct and easy to complete.

Based on the Beta testing feedback and applying the criteria above, the audit, instructions and user experience survey were revised and disseminated again to a sample of nurses in point of care leadership roles across 35 sites representing seven countries: Australia, Canada, Denmark, Ireland, New Zealand, Sweden, and the United States.

RESULTS

Hospital Characteristics

In total, 35 hospitals completed the survey between June 1, 2016 and August 31, 2016. The survey was completed by 8 hospitals in Canada, 5 in the United States, 3 in Australia, 1 in New Zealand, and 6 each in Denmark, Sweden, and Ireland. More hospitals were teaching hospitals (77%) than non-teaching hospitals (23%) (see Table 1).

Insert Table 1 here

Quality Indicators

Timing of Surgery

Overall, 32 hospitals (91%) reported a policy for timing of surgery: 17 (49%) for surgery within 24 hours. 1 (3%) within 36 hours and 14 (40%) within 48 hours. One hospital in Canada and 2 in the United States reported no policy for the timing of surgery (see Table 2). The response was 100%.

Early and Frequent Mobility

Overall, 23 hospitals (70%) promoted mobility on the day of surgery and during mealtimes. Twenty-four hospitals (73%) promoted mobilizing patients twice-daily beginning within two days of surgery while 23 hospitals (68%) reported a policy for patients to be out of bed for at least two meals beginning the day after surgery. Twenty-seven hospitals (79%) reported nurses ensure mobility standards are met (see Table 2). The response rate was 89%.

Malnutrition Prevention

Overall, 28 hospitals (82%) promoted a nutrition screen on admission. Preoperatively, 3 hospitals (9%) promoted a high carbohydrate drink within 4 hours before surgery, 11 hospitals (32%) promoted clear fluids up to 2 hours before surgery, and 25 hospitals (74%) provided a meal if surgical waiting time exceeds 8 hours. Postoperatively, 33 hospitals (97%) promoted diet as tolerated and 25 hospitals (74%) provided nutritional supplements (see Table 2). The response rate was 89%.

CAUTI Prevention

Overall, 22 hospitals (69%) supported avoiding the routine use of indwelling urinary

catheter, with 24 hospitals (73%) inserting only if predetermined criteria were met. Postoperative catheter removal was promoted within 24 hours for 15 hospitals (60%), 36 hours for 1 hospital (4%), 48 hours for 8 hospitals (32%), and 72 hours for 1 hospital (4%). Nurses removed catheters at 24 hospitals (73%) (see Table 2). The response rate was 66%. In particular, 10 hospitals (27%) did not complete the survey item related to the time of removal of indwelling urinary catheter.

Pain Management

All 35 hospitals (100%) supported regular pain assessment and reassessment with a valid tool. Overall 30 hospitals (86%) promoted a multi-modal approach to pain management, 33 hospitals (94%) scheduled administration of pain medication, and 26 hospitals (84%) supported using geriatric appropriate pain medication and dosage. Regional pain block was available at 15 hospitals (44%). Nurses administered regional pain block at 3 hospitals (9%) (see Table 2). The response rate was 80%.

Delirium

Overall, 23 hospitals (68%) supported completing a cognitive screen and 24 hospitals (71%) reported a policy directing completion of a delirium screen on admission. Daily delirium screening was supported by policy in 15 hospitals (43%). A protocol including delirium medication for at risk patients was reported in 28 hospitals (82%) (see Table 2). The response rate was 94%.

Pneumonia Prevention

Six hospitals (18%) promoted dysphagia screening prior to first postoperative meal, 21 hospitals (64%) utilized a mouth care protocol, and 17 hospitals (53%)supported elevating the head of the bed to 30 degrees (see Table 2). The response rate was 91%.

Constipation Prevention

Overall, 28 hospitals (80%) followed a bowel protocol, 34 (97%) hospitals assessed bowel movement daily and 32 (94%) hospitals reported having a policy supporting administration of laxatives prophylactically (see Table 2). The response rate was 100%.

VTE Prevention

All 35 hospitals (100%) followed a venous thromboembolism prophylaxis protocol (see Table 2). The response rate was 100%.

Pressure Injury Prevention

All 35 hospitals (100%) reported completion of a valid pressure injury risk assessment on admission and 31 hospitals (91%) promoted a head to toe skin assessment on admission. Overall, 33 hospitals (94%) followed a pressure injury care plan (see Table 2). The response rate was 97%.

Care Transitions/Preparing for Home

Overall, 22 hospitals (63%) reported having written patient self-management instructions while 9 hospitals (28%) reported a process that recommends a follow-up with a family practitioner within 4 weeks of discharge (see Table 2). The response rate was 80%.

Bone Health

Overall, 18 hospitals (53%) promoted bone health follow-up (see Table 2). The response rate was 91%.

Education Regarding Quality Indicators

During Beta testing, participants suggested adding a question to ascertain if staff received education about specific quality indicators, either in orientation, as part of annual competencies or other professional development initiatives. A question regarding staff

education was added to the final audit under each quality indicator. Results revealed that half or more of participating hospitals provided standards education about VTE (100%), pressure injury (85%), constipation (85%), pain (79%), CAUTI prevention (79%), nutrition (75%), mobility (62%), delirium (56%), care transition (53%), and pneumonia prevention (50%). Only bone health education (42%) was covered by less than 50% of hospitals (see Table 2).

Insert Table 2 here

User Experience Survey

A review of the User Experience Surveys found that : 1) the survey typically took 15 to 30 minutes to complete; 2) the content was viewed as relevant and applicable to the practice setting; and most importantly, 3) several site respondents noted that they intend to embark on improvement activities as a results of completing the audit such as:

- Including baseline cognitive assessment in the care plan;
- Strengthening/developing a delirium protocol;
- Early identification, screening and planning for dysphagia as part of pneumonia prevention; and
- Assessing/addressing nutritional needs.

DISCUSSION

This paper describes the process of developing an international audit tool for acute care nurses to identify, measure, and deliver best practice for older adults with fragility hip fracture. Expert orthopaedic nurses from nine countries across three continents contributed to this work offering the additional perspective of standards successfully tested across diverse health care systems. Developing and testing an audit in one

jurisdiction is valuable but developing an international consensus tool to assess best practice care for hip fracture patents could be used to influence care globally. Defining best practice care standards highlights the vital care that nurses provide.

This common injury – fragility hip fracture – regardless of jurisdiction requires a very similar approach to care. This cohort of patients represents primarily a frail older population and fragility hip fracture serves as a marker condition for not only how well care is delivered to older patients in an acute hospital but also how well an overall health care service functions. We have already seen the significant impact of hip fracture registries and audit programs to improving care delivery and outcomes in this frail group of patients (FFN, 2015)**.** Until now these registries have focused mainly on medical, surgical and secondary prevention standards with limited attention so the impact of nursing care on outcomes. Apart from pressure injury development and the more recent addition of pain assessment and nutrition in the United Kingdom registry (Royal College of Physicians, 2016), nursing care data has not routinely been included.

Considering nurses are at the bedside twenty-four hours per day, their input and influence on outcomes is significant. This audit tool provides the first comprehensive list of care indicators related to nursing care of fragility hip fracture and should allow nurses in any country to use this audit to benchmark their practice against best evidence. A rationale document was provided that succinctly outlines evidence supporting each of the items included in the audit tool. This document may also inform national registries or audit programs of relevant nurse sensitive indicators to consider for future inclusion (Hommel & Bääth, 2015).

Beta testing of the audit highlighted the need for clarification and refinement as

variances in resources, practice patterns, and terminology emerged. Common core standards were defined; however, there were some variations among countries e.g. preoperative fasting times were shorter in the European countries surveyed. The specifics of the standards were left broad enough to account for regional resources and practices; e.g. multi-modal analgesia did not define the specific drugs or doses to use for this population.

It is important to note that the audit was not designed to make comparisons across nations. Indeed, there was significant variation *within* nations, especially in those that do not have a national approach to standardized health care. The audit measures whether care standards are embedded in protocols, policies, and/or processes related to patient care but not whether the standards are actually applied in daily practice. Future plans of the ICON Hip Fracture Work Group include a patient chart audit to determine actual adherence to practice standards.

Despite the limitation of a small sample size, the testing of this audit tool demonstrates international agreement among orthopaedic nurses of a core set of quality indicators essential to ensuring optimal outcomes for older adults with fragility hip fracture.

CONCLUSION

Developing and testing an audit of nurse sensitive quality indicators for older adults with fragility hip fracture demonstrates consensus on common core best practices and highlights the collective will of nurses across multiple nations to provide optimal care. Nurses can tap into the wisdom of colleagues at home and abroad to facilitate practice improvements that enhance patient outcomes. This serves to strengthen the current

evidence base for nursing care of older adults with fragility hip fracture as well as promote ICON's goal of the universal application of the highest standard of orthopaedic nursing care.

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Table 1. *Characteristics of participating hospitals*

Countries (n=number of participating hospitals)	Teaching/University	Non-teaching/non-university
Canada (n=8)	6	2
USA (n=5)	3	2
Australia (n=4)	3	0
New Zealand (n=1)	1	0
Denmark (n=6)	4	2
Sweden (n=6)	4	2
Ireland (n=6)	6	0
All (n=35)	27	8

Table 2. *Percentages of orthopaedic units that have standards meeting best practice for the hip fracture population*

Category	Specifications	N=35	Y%(95% CI)
Timing for surgery	Policy for timing of surgery	35	91 (82-100)
	within 24 hours	35	49 (32-65)
	within 36 hours	35	3 (0-8)
	within 48 hours	35	40 (24-56)
Early and frequent mobility	Up to walk stand or sit on the side of the bed day of surgery	33	70 (54-85)
	Up for at least 2 meals daily beginning the day after surgery	34	68 (52-83)
	Walks twice daily minimum starting 1 day after surgery	33	73 (58-88)
	Nurse ensures mobility standard met	34	79 (66-93)
	Staff consistently educated at work to meet standards	34	62 (45-78)
Malnutrition prevention	Malnutrition evidence based screen tool on admit.	34	82 (70-95)
	High carbohydrate drink within 4 hours before surgery	34	9 (1-18)
	Clear fluids up to 2 hours before surgery	34	32 (17-48)
	Provide meal if no surgery in 8 hrs.	34	74 (59- 88)
	Regular diet as tolerated day of surgery	34	97 (91100)
	Scheduled administration of nutritional supplements	34	74 (59-88)
	Staff consistently educated at work to meet standards	32	75 (60-90)
CAUTI prevention	Avoid routine use of indwelling urinary catheter	32	69 (53-85)
	IUC inserted only if criteria met	33	73 (58-88)
	Remove IUC within 24 hours of surgery	25	60 (41- 9)
	within 36 hours	25	4 (0-12)
	within 48 hours	25	32 (14-50)
	within 72 hours	25	4 (0-12)
	Nurse can initiate catheter removal based on criteria	33	73 (58-88)
	Staff consistently educated at work to meet standards	31	81 (67-95)

Pain management	Regular assessment and reassessment of pain with valid tool	35	100 (-)
	Pharmacologic & non pharmacologic multi modal approach	35	86 (74-97)
	Scheduled administration of analgesics	35	94 (87-100)
	Geriatric appropriate analgesics/doses prescribed	31	84 (71-97)
	Regional pain block	34	44 (27- 61)
	Nurse administered pain block	33	9 (0-19)
	Staff consistently educated at work to meet standards		79 (65- 93)
Delirium	Cognitive status screen on admit	34	68 (52-83)
	Evidence based screening tool for delirium	34	71 (55-86)
	Delirium screen done daily	35	43 (26-59)
	Daily use of a tool to identify delirium risks	35	41 (25-58)
	Medications only used when the behaviors pose a risk to self or others.	34	82 (70-95)
	Staff consistently educated at work to meet standards	34	56 (39-73)
Pneumonia prevention	Dysphagia screen after surgery prior to meal	34	18 (5- 30)
	Mouth care protocol	33	64 (47-80)
	Head of bed elevated 30 degrees	33	53 (36-70)
	Staff consistently educated at work to meet standards	32	50 (33-67)
Constipation prevention	Bowel protocol in place	35	80 (67- 93)
	Bowel movement assessment daily	35	97 (92-100)
	Laxatives administered prophylactically per orders/protocol	34	94 (86-100)
	Staff consistently educated at work to meet standards	33	85 (73-97)
VTE prevention	Venous Thrombo Embolism prophylaxis protocol in place	35	100 (-)
Pressure Injury Prevention	Valid risk screen tool on admit.	35	100 (-)
	Assessment of head to toe pressure points on admit	34	91 (82-100)
	Standard care plan for added risk	35	94 (87-100)
	Staff consistently educated at work to meet standards	34	85 (73-97)
Care transitions/ preparing for home	Written self-management instructions provided	35	63 (47-79)
	Requested to follow up with family practitioner within 4 weeks	32	28 (13-44)
	Staff consistently educated at work to meet standards	30	53 (35- 1)
Bone health	Bone health follow up appointment made	34	53 (36-70)
	Staff consistently educated at work to meet standards	33	42 (26-59)